

OBSERVATIONS OF SEABIRDS AND SHOREBIRDS IN NUSA TENGGARA (LESSER SUNDAS) AND MOLUCCAS, INDONESIA

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ABSTRACT

Twenty-five islands were visited in Nusa Tenggara and Moluccas between 1988 and 1993 namely: Lombok, Sumbawa, Moyo, Sangeang, Komodo, Pasir, Rinca, Flores, Adonara, Lembata, Alor, Sabu (Savu), Roti, Ndana, Semau, Merah, Timor, Kera, Ambon, Banda, Wokam, Kai Besar, Kai Kecil, Tanimbar and Selaru. Forty-four species of seabird and shorebird were recorded, and for each of these I give details of distribution (including extra limital range), status and for some habitat preferences and breeding. Many of the species listed represent new island, archipelago and/or regional records. Other records extend the known dates of migrants in Wallacea and provide new breeding localities.

INTRODUCTION

This paper is based on information gathered during vertebrate surveys of islands in Nusa Tenggara and Moluccas from 1988 to 1993. The following islands were visited: Lombok from 1 to 7 May and 16 to 17 October, 1988; Sumbawa from 7 to 29 May 1988, Sumbawa, Sangeang and Moyo Is from 9 October to 19 November 1988; West Timor, Semau, Flores, Lembata and Adonara Is from 15 October to 25 November 1989; west Flores, Komodo, Pasir (8°33'S 119°40'E) Rinca, Semau and west Timor Is from 27 April to 4 June 1990; south-west Timor, Semau, Roti Ndana (10°59'S 122°53'E) and Sabu Is from 18 September to 30 October 1990; Pantar, Alor, Semau, Merah (islet off SE end of Semau I.), Kera (4 km NW Kupang) and south-west Timor Is, from 2 April to 16 May 1991; Banda Neira, Wokam (Aru Is) and Kai Is from 19 September to 29 October 1992; and Tanimbar and Selaru Is from 13 April to 4 May 1993.

In the annotated list I summarise for each species its relative abundance and give an outline of extra limital range and status in Wallacea. Classification and nomenclature follows Andrew (1972) and Storr and Johnstone (1979).

ANNOTATED SPECIES LIST

Calonectris leucomelas Streaked Shearwater. Loose flocks of 10, 60, 50 and 20 feeding well off Timor I. in c. lat. 9°30'S on 8 April 1991.

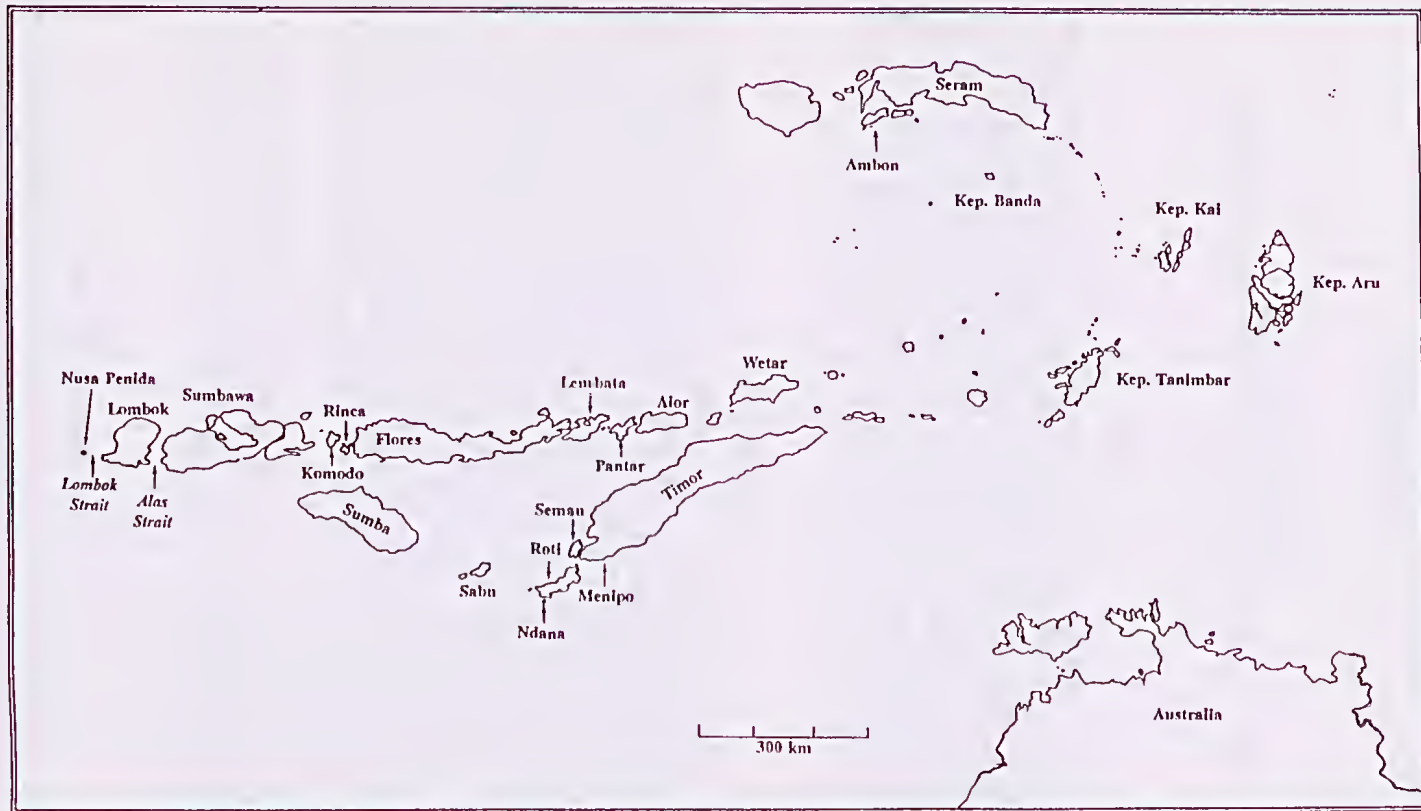


Figure 1. Map of Nusa Tenggara (Lesser Sundas) and Moluccas, Indonesia, showing islands visited.

Breeding on temperate and subtropical islands in north-west Pacific, and dispersing southwards mainly to equatorial seas. A winter visitor to Wallacea.

Puffinus pacificus Wedge-tailed Shearwater. One in the Lombok Strait on 31 May 1988; one between Semau and Roti Is on 5 October 1990; and 10 on the water and flying in Banda Sea (between Banda and Kai Is) on 30 September 1992. Breeding on numerous tropical and subtropical islands in Indian and Pacific Oceans, and dispersing widely. Status in Wallacea uncertain, very few published records.

Oceanodroma matsudairae Matsudaira's Storm-Petrel. One in the Lombok Strait on 31 May 1988. Breeding on Iwo Jima (Volcano Is) in subtropical north-west Pacific, and dispersing to north Indian Ocean. In Wallacea uncommon passage migrant.

Phaethon lepturus White-tailed Tropicbird. One in strait between Alor and Pantar Is on 9 April 1991. Breeding on tropical islands in Atlantic, Indian and Pacific Oceans. Status in Wallacea unknown.

Fregata minor Great Frigatebird. One off Rinca I. on 13 May 1990; 2 near Labuan Bajo, Flores I. on 15 May and 4 on 22 May 1990; one at sea well off Timor I. in c. lat. 9°30'S on 8 April 1990; and 4 near Hatta I. (Banda Sea) on 30 September 1992. Breeding on tropical islands in Atlantic, Indian and Pacific Oceans. Breeding and resident in Wallacea.

Fregata ariel Lesser Frigatebird. One just off Alas, Sumbawa I. on 29 May 1988; 2 off Moyo I. in November 1988; 1 in strait between Timor and Semau Is on 20 October 1990; groups of 8, 3 and 6 (including some immatures in Tual harbour (Kai Is) on 1 October, 1, 6 and a flock of 30 on 9 October; 2 over a fresh water lake on Kai Kecil I. on 9 October, and 10 (probably this species) at sea near Elat, Kai Besar I. on 12 October 1992; 1 in Saumlaki harbour (Tanimbar I.) on 15 April and 1 off Latdalam (Tanimbar I.) on 24 April 1993. Breeding on tropical islands in Atlantic, Indian and Pacific Oceans. Most are probably visitors from near Wallacea i.e. Cocos (Keeling) and Christmas Is and Ashmore Reef Is.

Fregata andrewsi Christmas Island Frigatebird. One female near Lembar Harbour, Lombok on 31 May 1988. Breeds on Christmas I (Indian Ocean). In Wallacea uncommon visitor.

Sula sula Red-footed Booby. Ten (mostly immatures) in Kalabahi harbour, Alor I. on 9 April, one at Kabir, Pantar I. on 21 April 1991; and one (a brown morph) landed on ferry SW of Alor in c. 8°30'S on 29 April 1991; over 30 near Hatta I. (between Banda and Kai Is) and 5 further east in Banda Sea on 30 September 1992; and 2 off Saumlaki, Tanimbar I. on 29 April 1993. Breeding on tropical islands in Atlantic, Indian and Pacific Oceans. Breeding and resident in Wallacea.

Sula leucogaster Brown Booby. One just off Alas, Sumbawa I. on 29

May 1988; and 2 near Hatta I. on 30 September 1992. Widespread in Indian and Pacific Oceans. Breeding and resident in Wallacea.

Pelecanus conspicillatus Australian Pelican. Recorded on Kai, Tanimbar and Selaru Is. Ones, twos and small groups (up to 6). Breeds in Australia. Status in Wallacea uncertain, recorded as casual or vagrant from Sulawesi and Lombok east and south to New Zealand.

Vanellus miles Masked Lapwing. One calling at night over Saumlaki, Tanimbar I. on 1 May 1993. Occurs in northern Australia and south New Guinea. Casual visitor to Ambon, Banda, Kai Is, Leti, Babar and Tanimbar Is.

Pluvialis squatarola Grey Plover. One on coastal flats near Bima, Sumbawa I. on 9 October 1988; ones, twos and a loose group of 8 at Tanjung Pasir, Moyo I. in November 1988; one on beach at Limaggu, Sabu I. on 3 October 1990; four on exposed reefs around Kera (Kra I., 4 km NW Kupang) on 7 April 1991; and 4 edge of airstrip Banda Neira I. on 23 September 1992. Breeding in arctic Europe, Asia and North America and wintering mainly south of Tropic of Cancer. In Wallacea, uncommon visitor and passage migrant.

Pluvialis fulva Pacific Golden Plover. Two on tidal flats at Sebatok, Moyo I. on 6 November 1988. Two single birds on sandy beach at Limaggu, Sabu I. on 1 and 2 October 1990; one edge of mangal at Lifuleo, Timor I. (10°28'S 123°30'E) on 5 and 6 May 1991; and one near Tual (Kai Is) on 10 October 1992. Breeding in arctic Asia and west Alaska, and wintering mainly in south Asia, Indo-Australian Archipelago, Australia and New Zealand. A passage migrant and winter visitor to Wallacea.

Charadrius dubius Little Ringed Plover. Two on Pasir I. (north, 8°33'S 119°40'E) off Komodo I. on 20 May 1990. Breeding in Europe, north Africa and north and central Asia, and wintering in Africa (south of Sahara) and south and east Asia, Philippines, New Guinea and Australia. Scarce winter visitor to Wallacea.

Charadrius ruficapillus Red-capped Plover. Two on beach at Uiasa, Semau I. (10°10'S 123°28'E) on 30 May 1990; and 5 at edge of a small lake near Panite, Timor I. on 26 October 1990. Vagrant from Australia (recorded as far west as Java).

Charadrius peronii Malaysian Plover. One collected from mouth of a small creek near Menia, and groups (up to 6) on beach at Limaggu, Sabu I. in September–October 1990; and 2 pairs on sandy beach on Kera I. (4 km NW Kupang) on 7 April 1991. Resident in Wallacea.

Charadrius mongolus Mongolian Plover. One at beach at Limaggu, Sabu I. on 1 October 1990. Breeding in north-east Asia, and wintering in south-east China and from Taiwan south to New Zealand. Scarce or rare in Wallacea, mainly on passage to and from Australia.

Charadrius leschenaultii Large Sand Plover. Two on Pasir I. (south) and one on Pasir I. (north) (8°33'S 119°40'E islets off Komodo I.) on 20 May 1990; 4 single birds on sandy beach at Limaggu, Sabu I. from 1–4 October 1990, and one on beach on Kera I. (4 km NW Kupang) on 7 April 1991. Breeding in central Asia, and wintering in east and southern Africa, Madagascar, south and east Asia, Indo-Australian Archipelago, Australia and recently Tasmania and New Zealand. In Wallacea, uncommon passage migrant and winter visitor.

Charadrius veredus Oriental Plover. One collected from grassland at Menia, Sabu I. on 29 September 1990; 2 edge of airstrip Banda Neira I. on 23 September 1992 and one on 24 and 26 September. Breeding in Mongolia, south Siberia and north China, and wintering mainly in northern Australia. In Wallacea mainly a passage migrant to and from Australia.

Numenius minutus Little Whimbrel. Two in low grass edge of airstrip at Banda Neira I. on 26 September 1992; and 5 over Adaut, Selaru I. on 28 April 1993. Breeding in north Siberia, and wintering mainly in northern Australia. In Wallacea rare, most birds on passage to or from Australia.

Numenius phaeopus Whimbrel. One on mudflat near Bima, Sumbawa I. on 19 October 1988; moderately common on Moyo I. in November 1988; one edge of a mangrove lined creek at Loho Liang, Komodo I. on 18 May and one on Pasir I. (north) on 20 May 1990; one collected from a beach at Menia and 2 single birds on beach at Limaggu, Sabu I. in September–October 1990; ones, twos and small groups (up to 10) on coasts of Roti I. in October 1990; two on beach at Ndana I. on 14 October 1990; one on rocks at Kera I. on 7 April 1991; one on landward edge of mangal at Kabir, Pantar I. on 20 April 1991; one on coast at Onansila, Semau I. on 5 May 1991; two on beach and another calling on Banda Neira I. on 24 September 1992; one in mangal at Karangguli, Aru Is on 5 October 1992; one on mudflats at Elat, Kai Is on 17 October 1992; and single birds in mangal near Saumlaki, Tanimbar I. on 14 and 15 April and 4 on 19 April 1993. Breeding in north-east Siberia, and wintering from east India, Taiwan and Palau south to Tasmania and New Zealand. In Wallacea a common passage migrant and winter visitor.

Limosa lapponica. Bar-tailed Godwit. Three feeding on mudflats near Alas, on 28 May 1988, and one on beach near Waworada, Sumbawa I. on 27 October 1988; one on tidal flats at Sebotok, Moyo I. on 6 November 1988; 16 on mudflats at small lake near Panite, Timor I. on 26 October 1990; one on coastal rocks at Batu, Pantar I. on 19 April 1991; 4 on beach at Merah I. (off south-east end of Semau I.) on 8 May 1991. Breeding in north Europe and north Asia, and Alaska, and wintering from south-east China and Taiwan south to Tasmania and New Zealand. In Wallacea, uncommon migrant and winter visitor.

Tringa stagnatalis Marsh Sandpiper. Ten on wet mudflats at small lake 15 km ENE Baa, Roti I. on 7 October, and 2 at a small lake 20 km SSE Baa, on 16 October 1990; 8 at a small lake near Panite, Timor I. on 26 October 1990; and one near Elat, Kai Is on 18 October 1992. Breeding in east Europe and central Asia, and wintering in Africa, south Asia, Indo-Australian Archipelago, Australia, Tasmania and occasionally New Zealand. There are few records for Wallacea; uncommon passage migrant and winter visitor.

Tringa nebularia Greenshank. One edge of creek near Panite, Timor I. on 19 October 1990. Breeding in north Europe and north Asia, and wintering in south Europe, Africa, south Asia and from Taiwan south to Tasmania and New Zealand. In Wallacea, listed by White and Bruce (1986) as common on passage and wintering.

Tringa glareola Wood Sandpiper. One at a small fresh water lake 20 km SSE Baa, Roti I. on 16 October 1990. Breeding in north Europe and north Asia, and wintering in Africa, south Asia and from Taiwan south to Australia. In Wallacea, listed by White & Bruce (1986) as common on passage and wintering.

Tringa terek Terek Sandpiper. One edge of water at a small lake near Panite, Timor I. on 26 October 1990. Breeding in north-east Europe and north Asia and wintering in east Africa, Madagascar, south and south-east Asia, Indo-Australian Archipelago, northern Australia and occasionally southern Australia, Tasmania and New Zealand. In Wallacea, few records mainly on passage possibly wintering.

Tringa hypoleucos Common Sandpiper. Two single birds on Sangeang I. in October 1988; moderately common on Moyo I. in November 1988; ones, twos and loose groups (up to 10) in rice fields and on coast at Menia and Limaggu, Sabu I. in September–October 1990; moderately common on coasts of Roti I. in October 1990; two single birds and a group of 3 on beach at Uiasa, Semau I. in October 1990 and single birds on coast on Onansila, Semau I. in May 1991; single birds observed in creeks, lakes and mangal on Timor I. in October 1990 and May 1991; 2 on rocks on Kera I. on 7 April 1991; 10 sightings all of single birds on beaches and rocks at Batu and in mangal at Kabir, Pantar I. in April 1991; ones, twos and groups (up to 4) on airstrip and beaches on Banda Neira I. in September 1992; 3 single birds recorded in mangal on Wokam I. in October 1992; single birds at Mun and Elat, Kai Besar I. in October 1992; and ones and twos at Saumlaki and Latdalam, Tanimbar I. in April 1993.

Breeding in Europe and north and central Asia, and wintering in south Europe, Africa, Madagascar, south Asia and from south Japan south to Australia. In Wallacea common on passage and wintering.

Tringa brevipes Grey-tailed Tattler. Moderately common on Sumbawa I. (recorded at Teluk Santong, near Alas, Empang and near Bima) and Moyo I., mainly tidal flats and beaches. One on Komodo I. and one on Pasir I. in April–June 1990; ones and twos on beaches at

Limaggu, Sabu I. and ones, twos and threes on coasts and inland lakes of Roti I. in September–October 1990; one at Onansila, Semau I. on 3 May 1991; one at Karangguli, Aru Is on 7 October 1992; and one near Elat, Kai Besar I. on 19 and 20 October 1992. Breeding in north Siberia, and wintering from south-east China, Taiwan and Carolines south to Tasmania and New Zealand. In Wallacea a common passage migrant and winter visitor.

Arenaria interpres Ruddy Turnstone. Two on sandy beach at Limaggu, Sabu I. on 1 October 1990; and 3 on exposed reef Kera I. on 7 April 1991. Breeding in far north of North America, Europe and Asia, from Ellesmere I. east to west Alaska, and wintering from Iceland, Japan, Hawaii and California south to South Africa, Tasmania, New Zealand and Chile. In Wallacea mainly a passage migrant.

Calidris alba Sanderling. Twenty on sandy beach at Limaggu, Sabu I. on 1 October 1990. Breeding in arctic regions, and wintering from British Isles, Caspian Sea, Japan, British Columbia and Massachusetts south to South Africa, Tasmania, New Zealand and southern South America. Very few records for Wallacea, passage migrant and winter visitor.

Calidris ruficollis Red-necked Stint. Two on beach at Limaggu, Sabu I. on 4 October 1991; flock of 10 and another of 50 at small lake near Panite, Timor I. on 26 October 1990; and one on weed bank on Kera I. on 7 April 1991. Breeding in arctic Asia and north-west Alaska, and wintering from south-east China and Taiwan south to Tasmania and New Zealand. In Wallacea a moderately common passage migrant and winter visitor.

Calidris subminuta Long-toed Stint. Ten in grass, mud and water at edge of a small lake 15 km ENE Baa, Roti I. on 7 October 1990. Breeding in Siberia, and wintering from India and Taiwan south to Australia. There are very few records for Wallacea, scarce or uncommon passage migrant and winter visitor.

Calidris acuminata Sharp-tailed Sandpiper. Eleven on mudflats edge of a small lake near Panite, Timor I. on 26 October 1990. Breeding on arctic coast of central-north Asia, and wintering from New Guinea south to Tasmania and New Zealand. In Wallacea mainly a passage migrant.

Limicola falcinellus Broad-billed Sandpiper. Two edge of small lake near Panite, Timor I. on 26 October 1990. Breeding in arctic Asia, and wintering from east India and Taiwan south to northern Australia. In Wallacea probably only on passage.

Phalaropus lobatus Red-necked Phalarope. Four feeding on calm waters between Moyo and Sumbawa Is on 14 November 1988; flocks of 15–20 in strait between Alor and Pantar Is on 15 April and 5–10,000 in loose flocks ranging from 10–500 feeding in the same strait

on 29 April 1991. Breeding in far north of Europe, Asia and North America, and wintering at sea off west Africa, east Asia (from Ryu Kyus south to Sundas and east to Bismarcks and western South America. Listed by White and Bruce (1986) as vagrant to Wallacea, however it would appear to be a common winter visitor to this region.

Esacus magnirostris Beach Stone-curlew. One on Moyo I. on 14 November 1988; one on Rinca I. on 12 May 1990; 2 on Pasir I. (north) on 20 May 1990; and 4 on stony flat on Merah I. on 8 May 1991. Occurs from Andaman Is, Malaya and Philippines south-east to northern Australia and New Caledonia. In Wallacea uncommon resident.

Stiltia isabella Australian Pratincole. One collected from a grassy coastal flat at Menia, Sabu I. on 28 September; and single birds and small flocks (up to 10) near Baa, Roti I. in October 1990. Breeding in arid northern and eastern Australia, and dispersing northwards (as far as Borneo, Sulawesi, Moluccas and New Guinea) and southwards. In Wallacea a non-breeding migrant or visitor from Australia.

Anous stolidus Common Noddy. One at sea near Kai I. on 1 October 1992. Breeding on islands in tropical and subtropical Indian Ocean and west and central Pacific from Laccadive, Ryu Kyu and Hawaiian Is south to Madagascar, Lord Howe I. and Norfolk I., and dispersing widely. There are few records for Wallacea.

Chlidonias hybrida Whiskered Tern. A flock of 60–80 flying between Semau and Roti Is on 5 October 1990 and two over a fresh water lake on Kai Kecil I. on 9 October 1992. Occurs in Australia, Tasmania and from Philippines and Java east to New Guinea. Status in Wallacea uncertain.

Sterna hirundo longipennis Common Tern. Eight at sea between Saumlaki, Tanimbar I. and Adaut, Selaru I. on 25 April, 1993. Breeding in north-east Asia, and wintering from east India and Sri Lanka east to New Britain, Solomons and eastern Australia. Few records for Wallacea, presumably a passage migrant.

Sterna sumatrana Black-naped Tern. Recorded on Rinca, Komodo, Pasir, Flores, Timor, Semau, Merah, Roti, Ndana, Alor, Pantar, Kai, Wokam, Tanimbar and Selaru Is. Common resident. Mainly ones, twos and small flocks (up to 20), occasionally larger flocks (up to 100). Ten pairs were breeding on a small limestone stack near Onansila, Semau I. on 4 May 1991; and 30–40 pairs were breeding on Merah I., (SE end of Semau I.) on 8 May 1991. These are the first breeding records for the Lesser Sundas.

Sterna anaethetus Bridled Tern. One dead immature on Pasir I. on 20 May 1990; small flocks (up to 6) off Komodo I. on 22 May 1990; flock of 6 near Semau I. on 28 May 1990; flocks of 8, 10 and 20 between Kupang and Semau I. in September–October 1990; one just off Kera

l. on 30 April 1991; small flocks (up to 6) off Roti I. and between Roti and Ndana Is in October 1990; flocks of 50, 5, 2 and 6 off SW Tanimbar I. on 20 April 1993; and flocks of 10, 5, 4, 100, 20 and 15 in strait between Tanimbar and Selaru Is in late April 1993.

Occurs in north and east Indian Ocean and west Pacific, north to Red Sea and Taiwan and south to northern and western Australia. Status in Wallacea is unclear, possibly some breeding, but most would be passage migrants to and from Australia.

Sterna fuscata Sooty Tern. Flock of 6 feeding off Komodo I. on 17 May 1990; flock of 150 between Semau and Roti Is and 2 just off Roti I. on 5 October 1990; 40 feeding off SW Timor on 8 April 1991; and 40 in Banda Sea (between Banda and Kai Is) on 30 September 1992. Breeding on tropical and subtropical islands in Indian Ocean and west Pacific from Laccadive, Andaman and Ryu Kyu Is south to Mascarene Is, Lord Howe I., Norfolk I. and Kermadec Is, and dispersing widely. Status in Wallacea unclear, very few records.

Sterna bergii Crested Tern. Recorded on Lombok, Sumbawa, Moyo, Komodo, Rinca, Flores, Semau, Timor, Merah, Roti, Ndana, Alor, Pantar, Banda Sea (between Banda and Kai Is) and Tanimbar I. Common, probably resident. Ones, twos and small flocks (up to 40).

Sterna bengalensis Lesser Crested Tern. Four on Kera I. on 7 April 1991; one at Limaggu, Sabu I. on 1 October and flock of 30 at same place on 4 October 1990; 6 off Kai Besar I. on 16 October 1992; and ones, twos and small flocks (up to 6) off SW Tanimbar I. and between Tanimbar and Selaru Is in April 1993. Ranges from south and east shores of Mediterranean, Red Sea and coasts of east Africa, Madagascar, south Asia, Indo-Australian Archipelago and northern Australia. Status in Wallacea uncertain, most birds possibly visitors from Australia.

Sterna albifrons sinensis Little Tern. Flocks of 100, 50, 20, 10, 30 and 100 were recorded flying north through the strait between Lombok and Sumbawa Is on 18 October 1988. This strait is probably an important flyway for this species between South East Asia and northern Australia. Eight (all in breeding plumage and involved in ground and low level breeding displays) on a stony flat on Merah I. on 8 May 1991. One nest with a single egg was also found at same place. One in Dobo harbour on 1 October and 3 near Karangguli, Wokam I. on 5 October 1992; and 2 in Saumlaki harbour, Tanimbar I. on 3 May 1993. Ranges from east India, Manchuria and Japan south to Tasmania and New Zealand. In Wallacea, resident and passage migrant.

DISCUSSION

Forty-six species were recorded during these surveys. Twenty-five species are migrants mainly from Holarctic and Palearctic regions

namely: Streaked Shearwater, Matsudaira's Storm-Petrel, Grey Plover, Pacific Golden Plover, Little Ringed Plover, Mongolian Plover, Large Sand Plover, Oriental Plover, Little Whimbrel, Whimbrel, Bar-tailed Godwit, Marsh Sandpiper, Wood Sandpiper, Greenshank, Terek Sandpiper, Common Sandpiper, Grey-tailed Tattler, Ruddy Turnstone, Sanderling, Red-necked Stint, Long-toed Stint, Sharp-tailed Sandpiper, Broad-billed Sandpiper, Red-necked Phalarope and Common Tern. Eleven species are resident in the Wallacean region namely: White-tailed Tropicbird, Great Frigatebird, Christmas Island Frigatebird, Red-footed Booby, Brown Booby, Malaysian Sand Plover, Beach Stone Curlew, Whiskered Tern, Black-naped Tern, Crested Tern and Little Tern. Ten species are migrants from Australia namely: Wedge-tailed Shearwater, Lesser Frigatebird, Australian Pelican, Masked Lapwing, Red-capped Plover, Australian Pratincole, Common Noddy, Bridled Tern, Sooty Tern and Lesser Crested Tern.

The Indonesian islands of Nusa Tenggara and Moluccas are situated directly north of Western Australia. Because of this they are well placed to receive Palaearctic shorebirds on passage to and from Australia, especially to north-western Australia which is a major wintering ground for many of these birds. There is however a great disparity between the numbers of shorebirds found in Wallacea compared to north-western Australia. Judging from our data and limited information available in the literature it appears that Wallacea is used mainly as short-term stopover for waders on their way to and from Australia. The main reason for this is no doubt the lack of suitable habitats on these islands. Wallacea consists of a large number of mostly small islands with fairly limited habitats. There are for example few large estuaries, coastal swamps, extensive blocks of mangal and most beaches are narrow and rocky or sandy. Some species such as the Little Whimbrel must overfly the region, judging from the lack of records, but for others, the Wallacean islands act as a screen reducing the numbers that reach Australia, for example the Red-necked Phalarope.

That is not to say however, that Wallacea is not important for seabirds and shorebirds. It does support good numbers of some northern visitors including the Whimbrel and Common Sandpiper, and for many species it is probably the most important section of the flyway between northern Asia and Australia. Many of the smaller species use the islands as staging or resting areas before moving on, and the seas provide valuable feeding areas for some seabirds during migration, especially Bridled and Little Terns.

In May 1988 Bridled Terns were migrating through the Lombok Strait and in April 1993 through the strait between Tanimbar and Selaru Is. This tern is almost entirely a breeding visitor to Western Australia arriving late September or October and leaving between late February and early May. Prior to this work nothing was known of the flyways used by this species to and from their breeding

quarters in Australia. Bridled Terns winter mainly in the seas off northern-eastern Borneo. The strait between Lombok and Sumbawa Is also appears to be an important flyway for migrating Little Terns.

The breeding sites listed for the Black-naped and Little Terns are the first for the Lesser Sundas and are especially important for the Little Tern which has declined throughout much of its range. Two tropical species, the Great Frigatebird and Red-footed Booby, breed in Wallacea and have recently colonised north-western Australia. The future conservation of these species in Wallacea will no doubt greatly affect their status in Australian waters.

Noteworthy also, but not treated in this paper, is the large scale migration of some Australian landbirds including the Sacred Kingfisher, Rainbow Bee-eater and Tree Martin, to the Lesser Sundas.

ACKNOWLEDGEMENTS

I thank Mr N. Kolichis whose grants to the Western Australian Museum defrayed the costs of most of my fieldwork. I also thank the Australian Nature Conservation Authority (formally Australian National Parks and Wildlife Service) who kindly provided funds for the 1991, 1992 and 1993 surveys. I am grateful to Dr Soetikno Wirioatmodjo of Puslitbang Biologi, Lembaga Ilmu Pengetahuan Indonesia, and Dr D.J. Kitchener of the Western Australian Museum for facilitating this collaborative project.

REFERENCES

- ANDREW, P. 1992. *The birds of Indonesia*. Kukila Checklist No. 1.
- JOHNSTONE, R.E., BALEN, S VAN and DEKKER, R.J. 1993. New bird records for the island of Lombok. *Kukila* 6(2): 124-128.
- STORR, G.M. and JOHNSTONE, R.E. 1979. *Field Guide to the birds of Western Australia*. Western Australian Museum, Perth.
- WHITE, C.M.N. and BRUCE, M.D. 1986. *The Birds of Wallacea (Sulawesi, the Moluccas and Lesser Sunda Islands, Indonesia)*. An annotated checklist. B.O.U. Checklist No. 7.